WHAT IS CLAIMED IS:

1. An apparatus having a transmitter and a receiver for sensing remote objects, wherein the transmitter comprises N transmitter source elements, the apparatus comprising:

a source generator configured to provide N equal carrier signals;

a modulator signal generator configured to generate N statistically independent chip sequences, wherein each chip sequence comprises a plurality of chips, each chip having a random phase; and

a modulator configured to independently modulate the N equal carrier signals with the N statistically independent chips sequences, respectively, to generate N modulated signals, wherein each modulated signal comprises a plurality of chips, each chip having a random phase,

2. The apparatus according to claim 1, wherein:

the N modulated signals are transmitted by the N transmitter source elements, respectively, forming a composite signal beam that conforms to a Rayleigh density function; and

the transmitter source elements are separated by approximately 1/2 wavelength.

3. The apparatus according to claim 1, wherein the source generator includes:

a generator configured to provide a stable carrier signal; and

a signal divider configured to divide the stable carrier signal into the N equal carrier signals.

4. The apparatus according to claim 1, wherein the modulated signals transmitted by the transmitter source elements are scattered by remote objects and

wherein the receiver shares the N transmitter source elements to receive the scattered modulated signals transmitted by the transmitter.

5. The apparatus according to claim 4, wherein the receiver further comprises a plurality of processing elements, one for each direction of interest, configured to perform beamforming on the received scattered modulated signals and signal comparison.

6. The apparatus according to claim 5, wherein each of the processing elements comprises:

a receiver modulator configured to adjust the received scattered modulated signals to form adjusted signals;

a signal combiner configured to combine the adjusted signals to form a resultant signal; and

a correlator configured to compare the resultant signal and a predicted transmitted signal.

7. The apparatus according to claim 4, wherein the receiver further comprises:

a storage element configured to store snapshots of the received scattered modulated signals and output the stored signals multiple times; and

a processing element configured to perform, for each direction of interest, beamforming on the stored signals and signal comparison.

8. The apparatus according to claim 7, wherein the processing element comprises:

a receiver modulator configured to adjust the received scattered modulated signals to form adjusted signals;

a signal combiner configured to combine the adjusted signals to form a resultant signal; and

a correlator configured to compare the resultant signal and a predicted transmitted signal.

9. The apparatus according to claim 4, wherein the receiver further comprises:

a signal combiner configured to combine the received scattered modulated signals to form a resultant signal; and

a plurality of processors, one for each direction of interest, configured to perform beamforming while performing signal comparison between the resultant signal and a predicted transmitted signal.

10. The apparatus according to claim 4, wherein the receiver further comprises:

a signal combiner configured to combine the received scattered modulated signals to form a resultant signal;

a storage element configured to store snapshots of the resultant signal and output the stored resultant signal multiple times; and

a processor configured to perform, for each direction of interest, beamforming while performing signal comparison between the resultant signal and a predicted transmitted signal with a signal processing means.

11. The apparatus according to claim 4, wherein the receiver further comprises a plurality of processing elements, one for each direction of interest, each configured to randomize phases of the received scattered modulated signals and to perform signal comparison.

12. The apparatus according to claim 11, wherein each of the processing elements comprises:

a receiver modulator configured to randomize phases of the received scattered modulated signals to form adjusted signals;

a signal combiner configured to combine the adjusted signals to form a resultant signal;

a first correlator configured to compare the resultant signal and a predicted received signal to form a first correlated signal; and

a second correlator configured to compare the first correlated signal and a predicted transmitted signal.

13. The apparatus according to claim 4, wherein the receiver further comprises:

a storage element configured to store snapshots of the received scattered modulated signals and output the stored signals multiple times; and

a processing element configured to randomize phases of the received signals and to perform signal comparison, for each direction of interest.

14. The apparatus of claim 13, wherein the processing element comprises:

a receiver modulator configured to randomize phases of the stored signals to form adjusted signals;

a signal combiner configured to combine the adjusted signals to form a resultant signal;

a first correlator configured to compare the resultant signal and a predicted received signal to form a first correlated signal; and

a second correlator configured to compare the first correlated signal and a predicted transmitted signal.

15. The apparatus according to claim 1, wherein the modulated signals transmitted by the transmitter source elements are scattered by remote objects and wherein the receiver includes receiver sensor elements separate from the transmitter source elements to receive the scattered modulated signals transmitted by the transmitter.

16. The apparatus according to claim 15, the receiver further comprises a plurality of processing elements, one for each direction of interest, configured to perform beamforming on the received scattered modulated signals and signal comparison.

17. The apparatus according to claim 16, wherein each of the processing elements comprises:

a receiver modulator configured to adjust the received scattered modulated signals to form adjusted signals;

a signal combiner configured to combine the adjusted signals to form a resultant signal; and

a correlator configured to compare the resultant signal and a predicted transmitted signal.

18. The apparatus according to claim 15, wherein the receiver further comprises:

a storage element configured to store snapshots of the received scattered modulated signals and output the stored signals multiple times; and

a processing element configured to perform, for each direction of interest, beamforming on the stored signals and signal comparison.

19. The apparatus according to claim 18, wherein the processing element comprises:

a receiver modulator configured to adjust the received scattered modulated signals to form adjusted signals;

a signal combiner configured to combine the adjusted signals to form a resultant signal; and

a correlator configured to compare the resultant signal and a predicted transmitted signal.

20. The apparatus according to claim 15, wherein the receiver further comprises:

a signal combiner configured to combine the received scattered modulated signals to form a resultant signal; and

a plurality of processors, one for each direction of interest, configured to perform beamforming while performing signal comparison between the resultant signal and a predicted transmitted signal.

21. The apparatus according to claim 15, wherein the receiver further comprises:

a signal combiner configured to combine the received scattered modulated signals to form a resultant signal;

a storage element configured to store snapshots of the resultant signal and output the stored resultant signal multiple times; and

a processor configured to perform, for each direction of interest, beamforming while performing signal comparison between the resultant signal and a predicted transmitted signal with a signal processing means.

22. The apparatus according to claim 15, wherein the receiver further comprises a plurality of processing elements, one for each direction of interest, configured to randomize the phases of the received scattered modulated signals and to perform signal comparison.

23. The apparatus according to claim 22, wherein each of the processing elements comprises:

a receiver modulator configured to randomize phases of the received scattered modulated signals to form adjusted signals;

a signal combiner configured to combine the adjusted signals to form a resultant signal;

a first correlator configured to perform signal comparison between the resultant signal and a predicted received signal to form a first correlated signal; and

a second correlator configured to perform signal comparison between the first correlated signal and a predicted transmitted signal.

24. The apparatus according to claim 15, wherein the receiver further comprises:

a storage element configured to store snapshots of the received scattered modulated signals and outputting the stored signals multiple times; and

a processor element configured to randomize phases of the received signals and to perform signal comparison for each direction of interest.

25 The apparatus of claim 24, wherein the processing element comprises:

a receiver modulator configured to randomize the phases of the stored signals to form adjusted signals;

a signal combiner configured to combine the adjusted signals to form a resultant signal;

a first correlator configured to compare the resultant signal and a predicted received signal to form a first correlated signal; and

a second correlator configured to compare the first correlated signal and a predicted transmitted signal.

26. A method for sensing remote objects comprising:

generating N equal carrier signals;

generating N statistically independent chip sequences, wherein each chip sequence comprises a plurality of chips, each chip having a random phase; and

independently modulating the N equal carrier signals with the N statically independent chip sequences, respectively, to generate N modulated signals, wherein each modulated signal comprises a plurality of chip, each chip having a random phase.

27. The method according to claim 26, wherein the N modulated signals are transmitted, the method further comprising:

receiving the transmitted modulated signals, wherein the transmitted modulated signals have been scattered by remote objects; and

performing beamforming and signal comparison on the received scattered modulated signals with a plurality of processors, one for each directions of interest.

28. The method according to claim 27, wherein, for each of the plurality of processors, performing beamforming and signal comparison comprises:

adjusting the received scattered modulated signals to form adjusted signals;

combining the adjusted signals to form a resultant signal; and

performing signal comparison between the resultant signal and a predicted transmitted signal.

29. The method according to claim 26, further comprising:

receiving the transmitted modulated signals, wherein the transmitted modulated signals have been scattered by remote objects;

storing snapshots of the received scattered modulated signals;

outputting the stored signals multiple times; and

performing beamforming and signal comparison, for each direction of interest, on the stored signals.

30. The method according to claim 29, wherein performing beamforming and signal comparison comprises:

adjusting the received scattered modulated signals to form adjusted signals;

combining the adjusted signals to form a resultant signal; and

performing signal comparison between the resultant signal and a predicted transmitted signal.

31. The method according to claim 26, further comprising:

receiving the transmitted modulated signals, wherein the transmitted modulated signals have been scattered by remote objects;

combining the received scattered modulated signals to form a resultant signal; and

performing beamforming on the resultant signal with a plurality of processors, one for each direction of interest, while performing signal comparison between the resultant signal and a predicted transmitted signal.

32. The method according to claim 26, further comprising:

receiving the transmitted modulated signals, wherein the transmitted modulated signals have been scattered by remote objects;

combining the received scattered signals to form a resultant signal;

storing snapshots of the resultant signal;

outputting the stored resultant signal multiple times; and

performing, for each direction of interest, beamforming on the resultant signal while performing signal comparison between the resultant signal and a predicted transmitted signal.

33. The method of claim 26, further comprising:

receiving the transmitted modulated signals, wherein the transmitted modulated signals have been scattered by remote objects; and

randomizing the phases of the received scattered modulated signals and performing signal comparison with a plurality of processors, one for each directions of interest.

34. The method according to claim 33, wherein, for each of the plurality of processors, randomizing and performing signal comparison comprises:

performing modulation on the received scattered modulated signals to form adjusted signals;

combining the adjusted signals to form a resultant signal;

performing signal comparison between the resultant signal and a predicted received signal to form a correlated signal; and

performing signal comparison between the correlated signal and a predicted transmitted signal.

35. The method of claim 26, further comprising:

receiving the transmitted modulated signals, wherein the transmitted modulated signals have been scattered by remote objects;

storing snapshots of the received scattered modulated signals;

outputting the stored signals multiple times; and

randomizing phases of the stored signals and performing signal comparison, for each direction of interest, with a processor.

36. The method according to claim 35, wherein, modulating and performing signal comparison comprises:

performing modulation on the received scattered modulated signals to form adjusted signals;

combining the adjusted signals to form a resultant signal;

performing signal comparison between the resultant signal and a predicted received signal to form a correlated signal; and

performing signal comparison between the correlated signal and a predicted transmitted signal.

37. An apparatus for receiving modulated signals to detect remotes objects, wherein the modulated signals have been transmitted by a transmitter wherein each modulated signal includes a plurality of chips, each chip having a random phase and wherein the modulated signals are scattered by remote objects, the receiver comprising:

receiver sensor elements to receive the scattered modulated signals; and

a plurality of processing elements, one for each direction of interest, configured to perform beamforming on the received scattered modulated signals and signal comparison.

38. The apparatus according to claim 37, wherein each of the processing elements comprises:

a receiver modulator configured to adjust the received scattered modulated signals to form adjusted signals;

a signal combiner configured to combine the adjusted signals to form a resultant signal; and

a correlator configured to compare the resultant signal and a predicted transmitted signal.

39. An apparatus for receiving modulated signals to detect remotes objects, wherein the modulated signals have been transmitted by a transmitter wherein each modulated signal includes a plurality of chips, each chip having a random phase and wherein the modulated signals are scattered by remote objects, the receiver comprising:

receiver sensor elements to receive the scattered modulated signals;

a storage element configured to store snapshots of the received scattered modulated signals and output the stored signals multiple times; and

a processing element configured to perform, for each direction of interest, beamforming on the stored signals and signal comparison.

40. The apparatus according to claim 39, wherein the processing element comprises:

a receiver modulator configured to adjust the received scattered modulated signals to form adjusted signals;

a signal combiner configured to combine the adjusted signals to form a resultant signal; and

a correlator configured to compare the resultant signal and a predicted transmitted signal.

41. An apparatus for receiving modulated signals to detect remotes objects, wherein the modulated signals have been transmitted by a transmitter wherein each modulated signal includes a plurality of chips, each chip having a random phase and wherein the modulated signals are scattered by remote objects, the receiver comprising:

receiver sensor elements to receive the scattered modulated signals;

a signal combiner configured to combine the received scattered modulated signals to form a resultant signal; and

a plurality of processors, one for each direction of interest, configured to simultaneously perform beamforming while performing signal comparison between the resultant signal and a predicted transmitted signal.

42. An apparatus for receiving modulated signals to detect remotes objects, wherein the modulated signals have been transmitted by a transmitter wherein each modulated signal includes a plurality of chips, each chip having a random phase and wherein the modulated signals are scattered by remote objects, the receiver comprising:

receiver sensor elements to receive the scattered modulated signals;

a signal combiner configured to combine the received scattered modulated signals to form a resultant signal;

a storage element configured to store snapshots of the resultant signal and output the stored resultant signal multiple times; and

a processor configured to perform, for each direction of interest, beamforming while performing signal comparison between the resultant signal and a predicted transmitted signal with a signal processing means.

43. An apparatus for receiving modulated signals to detect remotes objects, wherein the modulated signals have been transmitted by a transmitter wherein each modulated signal includes a plurality of chips, each chip having a random phase and wherein the modulated signals are scattered by remote objects, the receiver comprising:

receiver sensor elements to receive the scattered modulated signals; and

a plurality of processing elements, one for each direction of interest, each configured to randomize phases of the received scattered modulated signals and to perform signal comparison.

44. The apparatus according to claim 43, wherein each of the processing elements comprises:

a receiver modulator configured to randomize phases of the received scattered modulated signals to form adjusted signals;

a signal combiner configured to combine the adjusted signals to form a resultant signal;

a first correlator configured to compare the resultant signal and a predicted received signal to form a first correlated signal; and

a second correlator configured to compare the first correlated signal and a predicted transmitted signal.

45. An apparatus for receiving modulated signals to detect remotes objects, wherein the modulated signals have been transmitted by a transmitter wherein each modulated signal includes a plurality of chips, each chip having a random phase and wherein the modulated signals are scattered by remote objects, the receiver comprising:

receiver sensor elements to receive the scattered modulated signals;

a storage element configured to store snapshots of the received scattered modulated signals and output the stored signals multiple times; and

a processing element configured to randomize phases of the received signals and to perform signal comparison, for each direction of interest,.

46. The apparatus of claim 45, wherein the processing element comprises:

a receiver modulator configured to randomize phases of the stored signals to form adjusted signals;

a signal combiner configured to combine the adjusted signals to form a resultant signal;

a first correlator configured to compare the resultant signal and a predicted received signal to form a first correlated signal; and

a second correlator configured to compare the first correlated signal and a predicted transmitted signal.

47. An method for sensing remotes objects comprising:

receiving transmitted modulated signals, wherein the transmitted modulated signals have been transmitted by a transmitter and includes a plurality of chips, each chip having a random phase and wherein the modulated signals are scattered by remote objects;

performing beamforming and signal comparison on the received scattered modulated signals with a plurality of processors, one for each directions of interest.

48. The method according to claim 47, wherein, for each of the plurality of processors, performing beamforming and signal comparison comprises:

adjusting the received scattered modulated signals to form adjusted signals;

combining the adjusted signals to form a resultant signal; and

performing signal comparison between the resultant signal and a predicted transmitted signal.

49. An method for sensing remotes objects comprising:

receiving transmitted modulated signals, wherein the transmitted modulated signals have been transmitted by a transmitter and includes a plurality of chips, each chip having a random phase and wherein the modulated signals are scattered by remote objects;

storing snapshots of the received scattered modulated signals;

outputting the stored signals multiple times; and

performing beamforming and signal comparison on the stored signals, for each direction of interest,.

50. The method according to claim 49, wherein, performing beamforming and signal comparison comprises:

adjusting the received scattered modulated signals to form adjusted signals;

combining the adjusted signals to form a resultant signal; and

performing signal comparison between the resultant signal and a predicted transmitted signal.

51. An method for sensing remotes objects comprising:

receiving transmitted modulated signals, wherein the transmitted modulated signals have been transmitted by a transmitter and includes a plurality of chips, each chip having a random phase and wherein the modulated signals are scattered by remote objects;

combining the received scattered modulated signals to form a resultant signal; and

performing beamforming on the resultant signal with a plurality of processors, one for each direction of interest, while performing signal comparison between the resultant signal and a predicted transmitted signal.

52. An method for sensing remotes objects comprising:

receiving transmitted modulated signals, wherein the transmitted modulated signals have been transmitted by a transmitter and includes a plurality of chips, each chip having a random phase and wherein the modulated signals are scattered by remote objects;

combining the received scattered signals to form a resultant signal;

storing snapshots of the resultant signal;

outputting the stored resultant signal multiple times; and

performing, for each direction of interest, beamforming on the resultant signal while performing signal comparison between the resultant signal and a predicted transmitted signal.

53. An method for sensing remotes objects comprising:

receiving transmitted modulated signals, wherein the transmitted modulated signals have been transmitted by a transmitter and includes a plurality of chips, each chip having a random phase and wherein the modulated signals are scattered by remote objects; and

randomizing phases of the received scattered modulated signals and performing signal comparison with a plurality of processors, one for each directions of interest.

54. The method according to claim 53, wherein, for each of the plurality of processors, randomizing and performing signal comparison comprises:

randomizing phases of the received scattered modulated signals to form adjusted signals;

combining the adjusted signals to form a resultant signal;

performing signal comparison between the resultant signal and a predicted received signal to form a correlated signal; and

performing signal comparison between the correlated signal and a predicted transmitted signal.

55. An method for sensing remotes objects comprising:

receiving transmitted modulated signals, wherein the transmitted modulated signals have been transmitted by a transmitter and includes a plurality of chips, each chip having a random phase and wherein the modulated signals are scattered by remote objects;

storing snapshots of the received scattered modulated signals;

outputting the stored signals multiple times; and

randomizing phases of the stored signals and performing signal comparison, for each direction of interest, with a processor.

56. The method according to claim 55, wherein, randomizing and performing signal comparison comprises:

randomizing phases of the received scattered modulated signals to form adjusted signals;

combining the adjusted signals to form a resultant signal;

performing signal comparison between the resultant signal and a predicted received signal to form a correlated signal; and

performing signal comparison between the correlated signal and a predicted transmitted signal.